Quarterly Report – Public Page

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Contract Number:	DTPH56-15-T-00019
Prepared for:	DOT/PHMSA
Project Title:	Intrinsically Locatable Technology for Plastic Piping Systems
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For quarterly period ending: December 31, 2015

Project Scope

The scope of the project will be to develop an electronic marking system that will provide locatability to the target depths on various diameter high density polyethylene (HDPE) and medium density polyethylene (MDPE) for gas applications. The project will also assess the technology capabilities versus pipe diameter, burial depth, and pipe burial methods (horizontal directional drilling, open trench, etc.). Included in the marker development will be the development of a flexible housing to allow the solution to be adaptable to a wide range of pipe diameter sizes. The attachment method will be integrated into the plastic pipe manufacturer process and workflow. Laboratory and field evaluations will be performed to validate the system to be commercially viable as an intrinsically locatable PE piping system.

Technical Status

During the first quarter, the project team scheduled and held a kick off meeting to review the projects scope and efforts. The team will also review the technology development plan and make changes if necessary. The gas utilities will be surveyed to identify and verify current PE pipe and tracer wire installation and location methods and the issues facing the industry.

The project team also contacted several gas utilities to better understand their installation practices for both PE gas mains and services. Table 1 below is a summary of the information obtained from the various gas utilities across the country related to new installations of PE gas mains and services.

The first stage of developing an intrinsically locatable plastic pipe solution consists of developing concepts and assessing the detection distance of high output flexible electronic markers using magneto-mechanical resonators. This will be followed by evaluating the location and depth accuracy of these markers when detected with a pipe/cable locator as well as their performance stability over time under the various relevant environmental conditions.

All the following activities were completed during the 1st quarter:

- Developed a target specification using input at system level, including performance, accuracy, durability and applicability specification.
- Concepts were developed for a flexible magneto-mechanical resonator and housing.
- Breadboards were built.
- Completed assessments of detection distance and accuracy along with stability of marker resonant frequency over time and ambient conditions. Locator used was a 3M Dynatel 7420 which is equivalent to the 3M Dynatel 7550

Results and Conclusions:

The project is progressing well with various concepts for the intrinsically locatable plastic pipe system design developed and initially evaluated. All the requirements of deliverable #1 and deliverable #2 (Task #2) were completed. Target system specifications, design specifications, concepts, breadboards and assessments are complete and show design capability.

Plans for Future Activity:

During the next quarter, the following activities will be conducted:

- Assess marker location accuracy, detection gap, and depth accuracy at 2', 3' & 4' away from Locator when markers placed 6', 8' & 10' apart.
- Develop concepts for a flexible housing to meet the bend radius, pipe type, pipe size and installation method. Build breadboards. Assess the concepts.